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FLOOD INSURANCE STUDY

CITY OF CHATTAHOOCHEE, FLORIDA
GADSDEN COUNTY

ORIGINAL

SEPTEMBER 4, 1987

Federal Emergency Management Agency

COMMUNITY NUMBER - 120092

CDD

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NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program (NFIP) have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study (FIS) may not contain all data available within the repository. It is advisable to contact the community repository for any additional data.

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FLOOD INSURANCE STUDY
CITY OF CHATTAHOOCHEE, GADSDEN COUNTY, FLORIDA

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study investigates the existence and severity of flood hazards in the City of Chattahoochee, Gadsden County, Florida, and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study has developed flood risk data for various areas of the community that will be used to establish actuarial flood insurance rates and assist the community in its efforts to promote sound floodplain management. Minimum floodplain management requirements for participation in the National Flood Insurance Program (NFIP) are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

In some states or communities, floodplain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the state (or other jurisdictional agency) will be able to explain them.

1.2 Authority and Acknowledgments

The sources of authority for this Flood Insurance Study are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

The hydrologic and hydraulic analyses for this study were prepared by the U. S. Geological Survey (USGS) for the Federal Emergency Management Agency (FEMA), under Contract No. EMW-85-E-1823. This work was completed in June 1986.

1.3 Coordination

On February 19, 1985, an initial Consultation and Coordination Officer's (CCO) meeting was held with representatives of FEMA, the city, and the USGS (the study contractor) to determine the streams to be studied.

On February 25, 1987, a final CCO meeting was held with representatives of FEMA, the city, and the study contractor to review the results of the study.

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2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the incorporated area of the City of Chattahoochee, Gadsden County, Florida. The area of study is shown on the Vicinity Map (Figure 1).

The Apalachicola River was studied for flooding affecting the community from the Louisville and Nashville Railroad to a point approximately 500 feet downstream of the Jim Woodruff Dam. The Mosquito Creek was studied by detailed methods for its entire stream length within the community. The areas studied by detailed methods were selected with priority given to all known flood hazard areas and areas of projected development and proposed construction through June 1991.

A tributary of South Mosquito Creek and a tributary of Mosquito Creek were studied by approximate methods. Approximate analyses were used to study those areas having a low development potential or minimal flood hazards. The scope and methods of study were proposed to, and agreed upon by, FEMA and the City of Chattahoochee.

2.2 Community Description

The City of Chattahoochee is located in the northeast quadrant of Gadsden County. The city is bordered by the unincorporated areas of Gadsden County to the east, south, and west; and the unincorporated areas of Decatur County, Georgia, to the north.

2.3 Principal Flood Problems

Mosquito Creek, in the City of Chattahoochee, has large areas subject to backwater flooding from the Apalachicola River. At the present time, however, the potential for damage is small due to lack of development in the floodplain. The State Route 269 bridge at River Junction on the south side of Chattahoochee will be inundated by the 100-year flood due to this backwater. The greatest amount of damage to existing structures by the 100-year flood elevation will occur in that reach of the stream north of State Route 269 and south of U. S. Route 90 where the majority of development has taken place. Flooding of this magnitude will cover a large area of the floodplain.

No reliable record exists of the flood of March 1929 on Mosquito Creek. Discharge data from the USGS stream gaging station on Mosquito Creek at Chattahoochee (1936-1942) with a drainage area of 57.9 square miles, located at the old highway bridge approximately 500 feet north of U. S. Route 90, offered no comparative value to the 100-year flood elevation considered in this report.

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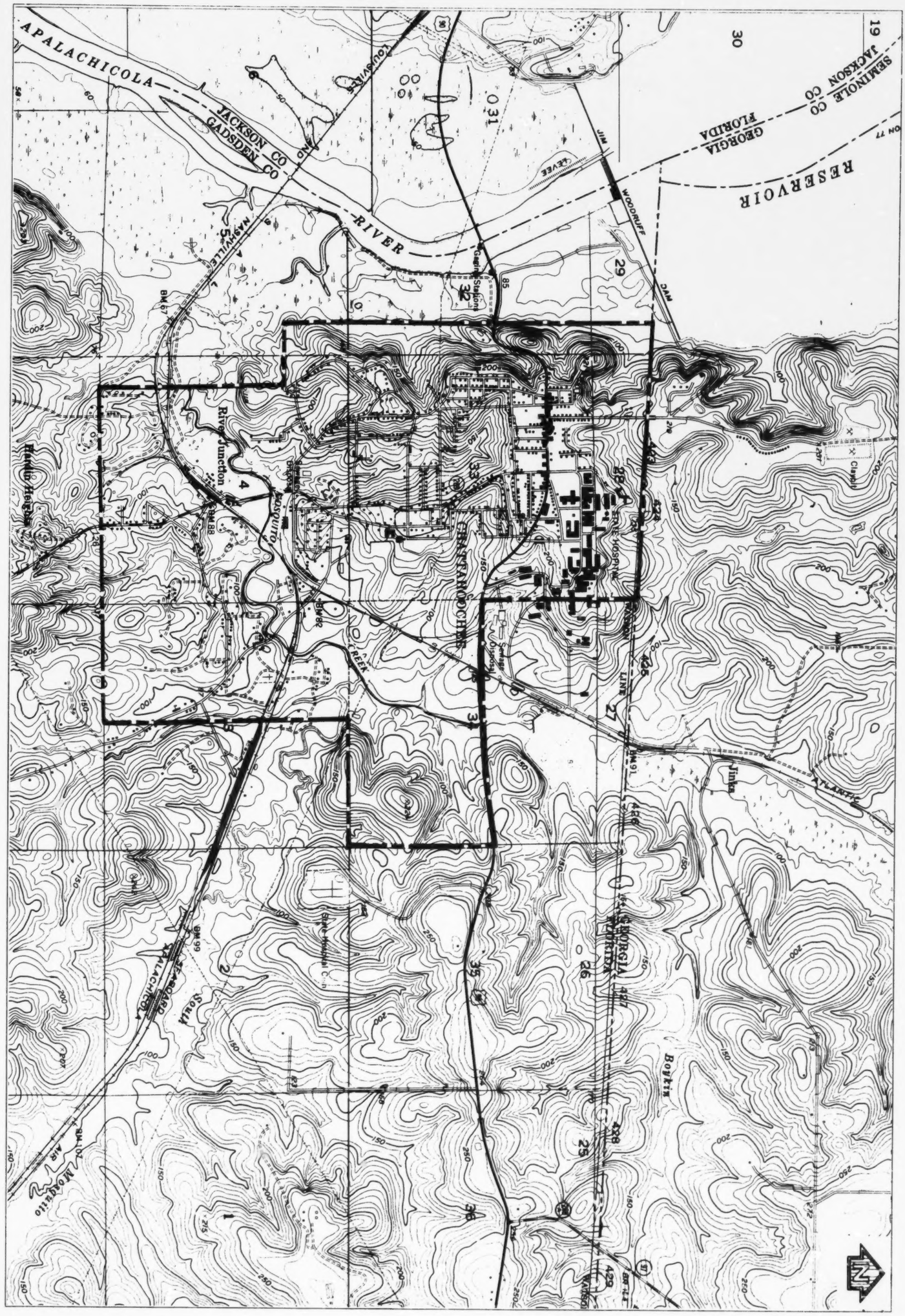

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CITY OF CHATTAHOOCHEE, FL
(GADSDEN CO.)

APPROXIMATE SCALE
2000 0 2000 4000 6000 FEET

VICINITY MAP

FIGURE 1

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The largest flood recorded at the USGS stream gaging station on the Apalachicola River at Chattahoochee (1928-1986) with a drainage area of approximately 17,200 square miles, located 0.6 mile above the mouth of Mosquito Creek, occurred March 20, 1929. The maximum elevation of this flood was 79.55 feet, with a peak discharge of 293,000 cfs (Reference 1). This flood has a recurrence interval of approximately 150 years or a 1 in 150 chance, on the average, of occurring in any given year (Reference 2).

2.4 Flood Protection Measures

At this time, the City of Chattahoochee has no flood protection measures in place on Mosquito Creek. Lake Seminole and the Jim Woodruff Dam on the Apalachicola River, 1.2 miles above the mouth of Mosquito Creek will have negligible effect in regulating backwater conditions present on Mosquito Creek for the 100-year flood elevation.

3.0 ENGINEERING METHODS

For the flooding sources studied in detail in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. A flood event of a magnitude which is expected to be equaled or exceeded once on the average during any 100-year period (recurrence interval) has been selected as having special significance for floodplain management and for flood insurance rates. This event, commonly termed the 100-year flood, has a 1 percent chance of being equaled or exceeded during any year. Although the recurrence interval represents the long term average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood which equals or exceeds the 100-year flood (1 percent chance of annual exceedence) in any 50-year period is approximately 40 percent (4 in 10), and, for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for each flooding source studied in detail affecting the community.

The peak discharge for the 100-year frequency storm on the Apalachicola River was obtained from existing flood-frequency data (Reference 3).

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The peak discharge for the 100-year frequency storm on Mosquito Creek was determined from equations for estimating peak flow from natural-flow streams in Florida (Reference 2).

A summary of the drainage area-peak discharge relationships for the streams studied by detailed methods is shown in Table 1, "Summary of Discharges."

TABLE 1 - SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 100-YEAR
APALACHICOLA RIVER		
At USGS stream gage, approximately 0.6 mile upstream of confluence of Mosquito Creek	17,200	270,000
MOSQUITO CREEK		
At confluence with the Apalachicola River	89.2	10,500
At State Route 269	86.2	10,200
At confluence of South Mosquito Creek	58.5	6,360
At U. S. Route 90	58.0	6,300

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the source studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals.

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1) and the Flood Insurance Rate Map (Exhibit 2), where applicable.

Existing analyses of hydraulic characteristics were used for the Apalachicola River (Reference 3).

The USGS computer program E431 was utilized to perform the backwater computations (Reference 4).

Flood profiles were drawn showing computed water-surface elevations for floods of the selected recurrence intervals. The starting water-surface elevation for Mosquito Creek was obtained from slope/area computations.

Channel roughness factors (Manning's "n") used in hydraulic computations were chosen by engineering judgment based on field observations and by previously used values in the vicinity of the bridge cross section at State Route 269. Roughness values from 0.035 in the main channel to 0.100 for the floodplain were used.

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The hydraulic analyses for this study were based on unobstructed flow. The flood elevations shown on the profiles are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

All elevations are referenced to the National Geodetic Vertical Datum of 1929 (NGVD). Elevation reference marks used in this study are shown on the maps; the descriptions of the marks are presented in Elevation Reference Marks (Exhibit 3).

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The NFIP encourages State and local governments to adopt sound floodplain management programs. Therefore, each Flood Insurance Study provides 100-year flood elevations and delineations of the 100-year floodplain boundaries to assist communities in developing floodplain management measures.

4.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1 percent annual chance (100-year) flood has been adopted by FEMA as the base flood for floodplain management purposes. For the streams studied in detail, the 100-year floodplain boundaries have been delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using topographic maps at a scale of 1:24,000 with a contour interval of 10 feet (Reference 5).

For the streams studied by approximate methods, the 100-year flood boundary was delineated using the Flood Hazard Boundary Map for the City of Chattahoochee (Reference 6).

The 100-year floodplain boundaries are shown on the Flood Insurance Rate Map (Exhibit 2). On this map, the 100-year floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zones A and AE). Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

4.2 Floodways

Encroachment on floodplains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard. For purposes of the National Flood Insurance Program, a floodway is used as a tool to assist local communities in this aspect of floodplain management. Under this concept, the area of the 100-year floodplain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent floodplain

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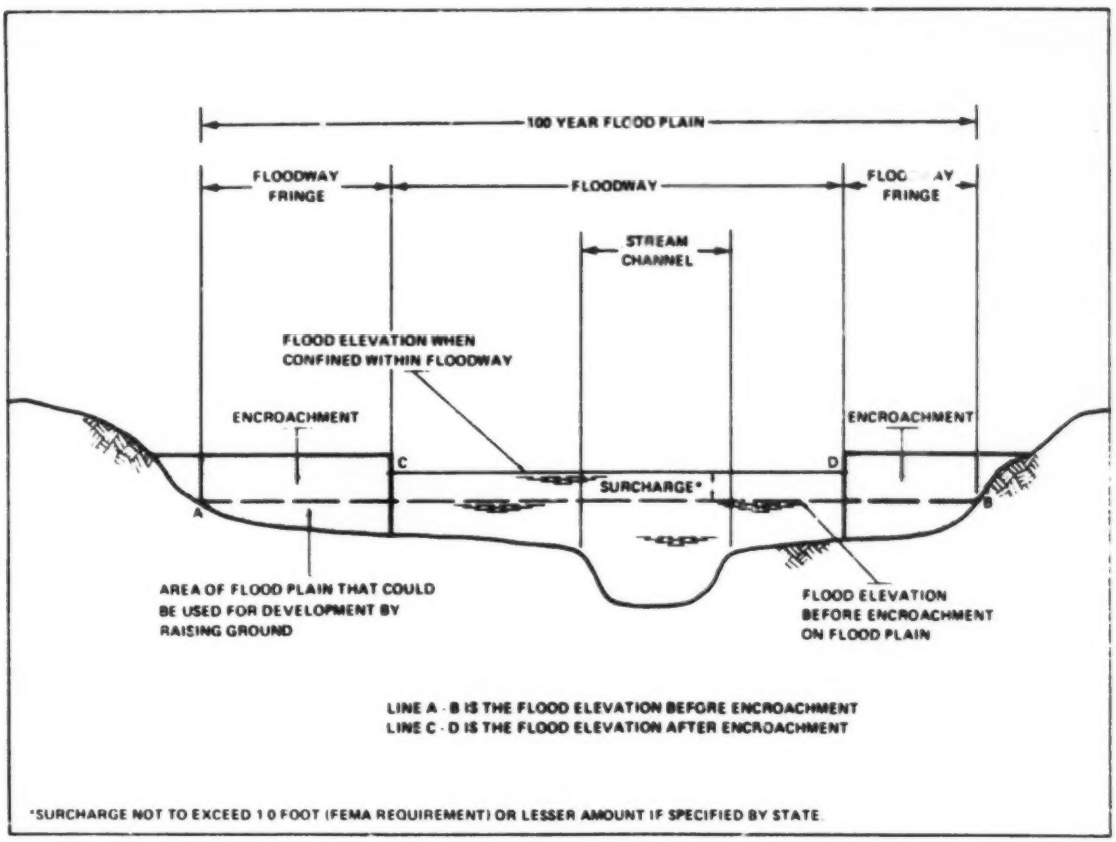
areas, that must be kept free of encroachment so that the 100-year flood can be carried without substantial increases in flood heights. Minimum federal standards limit such increases to 1.0 foot, provided that hazardous velocities are not produced.

The area between the floodway and 100-year floodplain boundaries is termed the floodway fringe. The floodway fringe encompasses the portion of the floodplain that could be completely obstructed without increasing the water-surface elevation of the 100-year flood by more than 1.0 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 2.


100 YEAR FLOOD PLAIN
FLOODWAY FRINGE
FLOODWAY
FLOODWAY FRINGE
STREAM CHANNEL
FLOOD ELEVATION WHEN CONFINED WITHIN FLOODWAY
ENCROACHMENT
ENCROACHMENT
C
D
SURCHARGE*
A
B
AREA OF FLOOD PLAIN THAT COULD BE USED FOR DEVELOPMENT BY RAISING GROUND
FLOOD ELEVATION BEFORE ENCROACHMENT ON FLOOD PLAIN
LINE A - B IS THE FLOOD ELEVATION BEFORE ENCROACHMENT
LINE C - D IS THE FLOOD ELEVATION AFTER ENCROACHMENT
*SURCHARGE NOT TO EXCEED 1.0 FOOT (FEMA REQUIREMENT) OR LESSER AMOUNT IF SPECIFIED BY STATE.

FLOODWAY SCHEMATIC

Figure 2

No floodways were calculated as part of this study.

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5.0 INSURANCE APPLICATION

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses. These zones are as follows:

Zone A

Zone A is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no base flood elevations or depths are shown within this zone.

Zone AE

Zone AE is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by detailed methods. In most instances, whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AH

Zone AH is the flood insurance rate zone that corresponds to the areas of 100-year shallow flooding (usually areas of ponding) where average depths are between 1 and 3 feet. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AO

Zone AO is the flood insurance rate zone that corresponds to the areas of 100-year shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. Average whole-foot depths derived from the detailed hydraulic analyses are shown within this zone.

Zone A99

Zone A99 is the flood insurance rate zone that corresponds to areas of the 100-year floodplain that will be protected by a Federal flood protection system where construction has reached specified statutory milestones. No base flood elevations or depths are shown within this zone.

Zone V

Zone V is the flood insurance rate zone that corresponds to the 100-year coastal floodplains that have additional hazards associated with storm waves. Because approximate hydraulic analyses are performed for such areas, no base flood elevations are shown within this zone.

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Zone VE

Zone VE is the flood insurance rate zone that corresponds to the 100-year coastal floodplains that have additional hazards associated with storm waves. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone X

Zone X is the flood insurance rate zone that corresponds to areas outside the 500-year floodplain, areas within the 500-year floodplain, and to areas of 100-year flooding where average depths are less than 1 foot, areas of 100-year flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 100-year flood by levees. No base flood elevations or depths are shown within this zone.

Zone D

Zone D is the flood insurance rate zone that corresponds to unstudied areas where flood hazards are undetermined, but possible.

6.0 FLOOD INSURANCE RATE MAP

The Flood Insurance Rate Map is designed for flood insurance and floodplain management applications.

For flood insurance applications, the map designates flood insurance rate zones as described in Section 5.0 and, in the 100-year floodplains that were studied by detailed methods, shows selected whole-foot base flood elevations or average depths. Insurance agents use the zones and base flood elevations in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

For floodplain management applications, the map shows by tints, screens, and symbols, the 100-year floodplain. The locations of selected cross sections used in the hydraulic analyses are shown where applicable.

7.0 OTHER STUDIES

Wetland hydrology and tree distribution of the Apalachicola River floodplain was done in 1983 (Reference 3). Results from that study were used to produce the Apalachicola River 100-year frequency storm profile.

Due to its more detailed nature, this study supersedes the Flood Hazard Boundary Map for the City of Chattahoochee (Reference 6).

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8.0 LOCATION OF DATA

Information concerning the pertinent data used in preparation of this study can be obtained by contacting FEMA, the Natural and Technological Hazards Division, 1371 Peachtree Street Northeast, Suite 700, Atlanta, Georgia 30309.

9.0 BIBLIOGRAPHY AND REFERENCES

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3. U. S. Department of the Interior, Geological Survey, Water-Supply Paper 2196-A, Wetland Hydrology and Tree Distribution of the Apalachicola River Floodplain, Florida by Helen M. Leitman, J. E. Sohm, and M. A. Franklin, Washington, D. C., 1983.

4. U. S. Department of the Interior, Geological Survey, Open-File Report 76-499, Computer Program E431, Computer Applications for Step-Backwater and Floodway Analyses by James O. Shearman, Washington, D. C., 1976.

5. U. S. Department of the Interior, Geological Survey, 7.5-Minute Series Topographic Maps, Scale 1:24,000, Contour Interval 10 Feet: Chattahoochee, Florida-Georgia, 1982.

6. U. S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Hazard Boundary Map, City of Chattahoochee, Gadsden County, Florida, July 19, 1974.

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EXHIBIT 3 - ELEVATION REFERENCE MARKS

Reference Mark	Elevation (Feet NGVD)	Description of Location
RM 1	79.16	Top of 1-inch bolt in southeast corner of base of signal switch box on east side of State Route 269, approximately 30 feet north of Seaboard Coast Line Railroad.
RM 2	80.20	Chiseled square on top right end of downstream wing wall on Seaboard Coast Line Railroad bridge over Mosquito Creek, approximately .23 mile northeast of Seaboard Coast Line Railroad and State Route 269 intersection.
RM 3	82.20	Standard disk stamped H88 1934, approximately .53 mile northeast along Seaboard Coast Line Railroad from intersection with State Route 269, 24.5 feet southeast of southeast rail, 104 feet south of Seaboard Coast Line Railroad and Lincoln Drive intersection, approximately 1 foot below track level, set in top of concrete post projecting 1 inch.
RM 4	78.19	Chiseled square in base of street curb, adjacent to railroad warning signal on north side of Lincoln Drive at Apalachicola Northern Railroad crossing.
RM 5	97.58	Railroad spike in south base of railroad switch signal on west side of Seaboard Coast Line Railroad track, approximately .96 mile northeast of intersection with State Route 269, and approximately 200 feet south of railroad spur.
RM 6	104.93	Chiseled square near northwest corner of bridge support under U. S. Route 90, approximately 95 feet west of Mosquito Creek.

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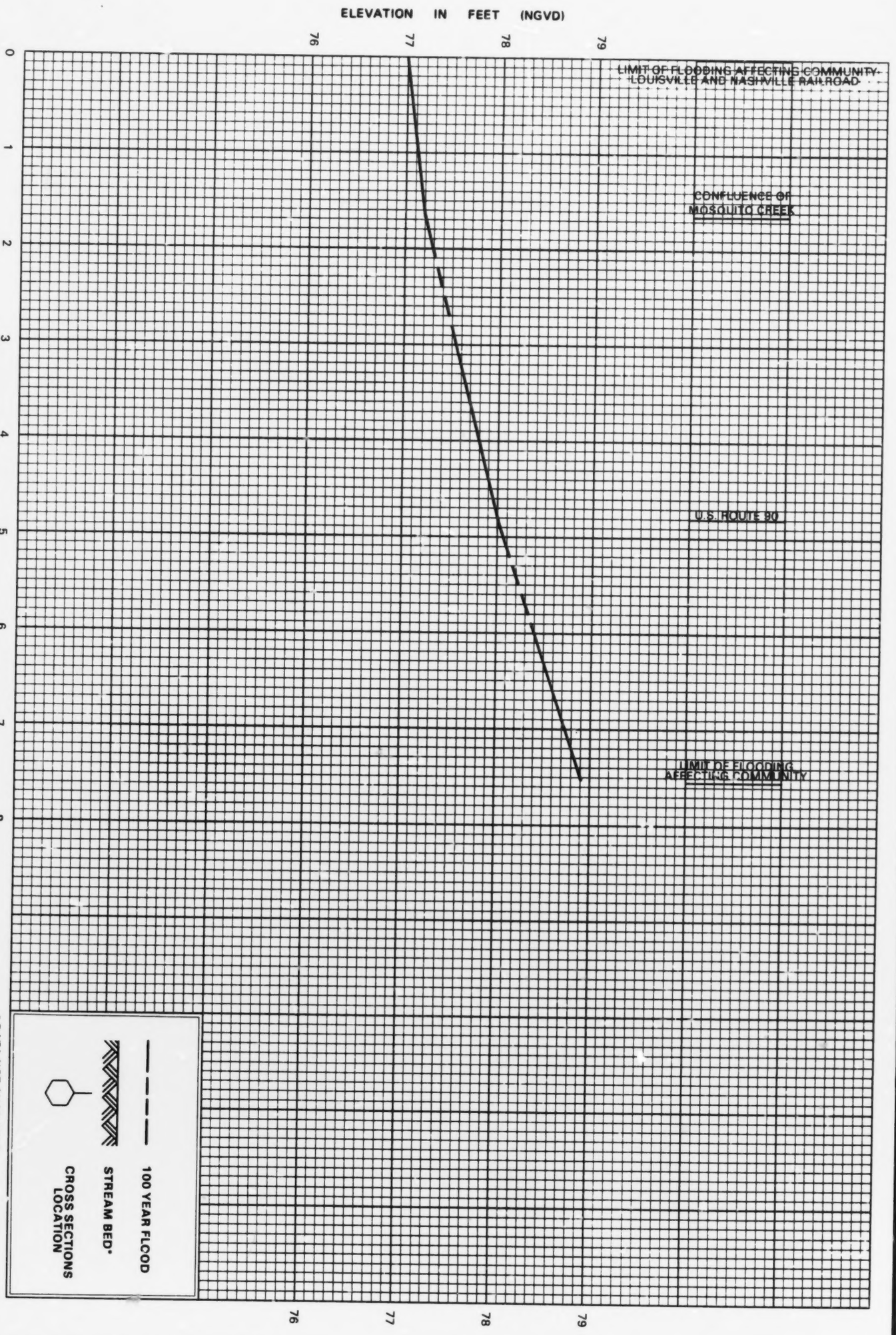

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FEDERAL EMERGENCY MANAGEMENT AGENCY

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FLOOD PROFILES

APALACHICOLA RIVER

01P

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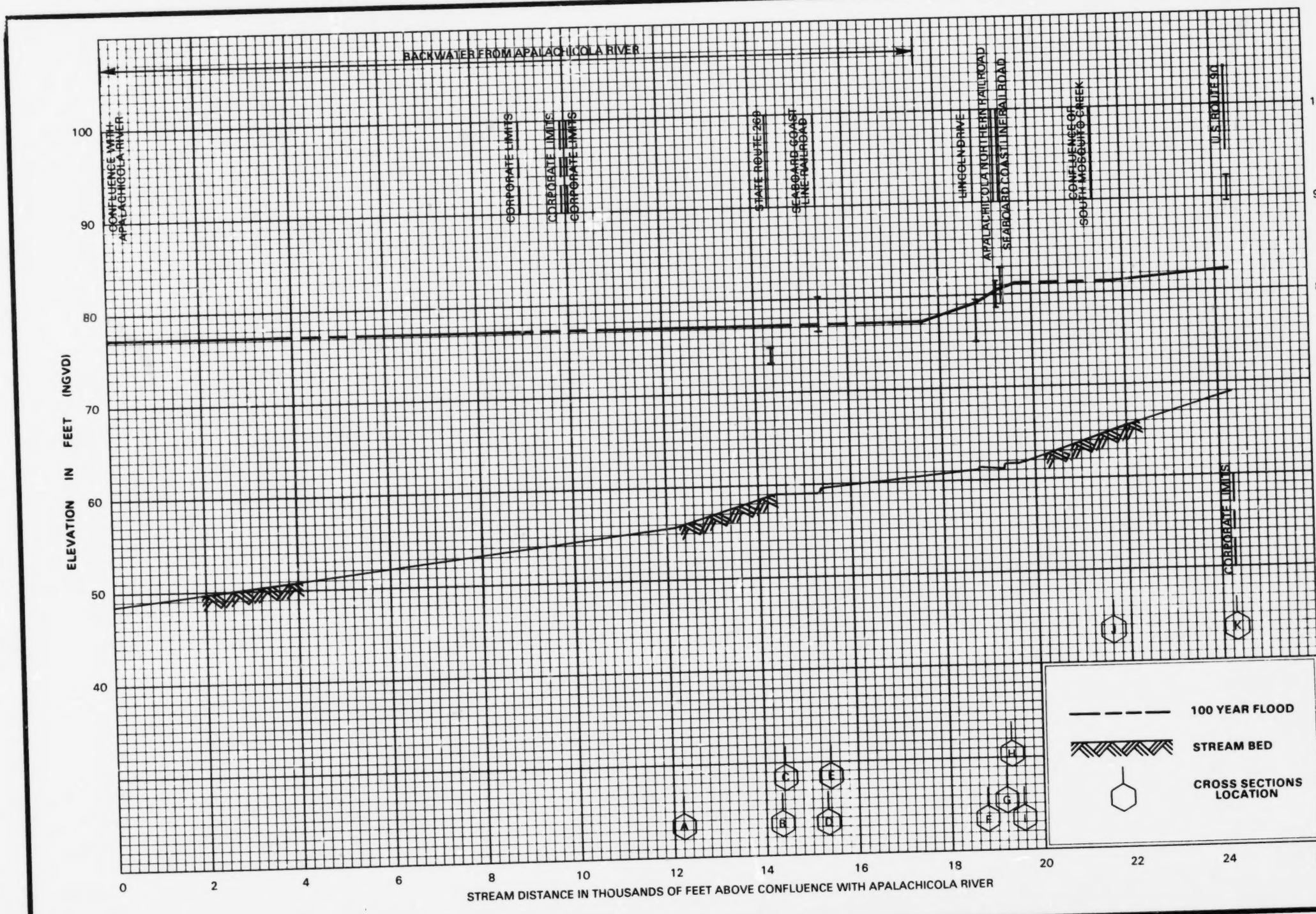

FLOOD PROFILES

MOSQUITO CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF CHATTAHOOCHEE, FL
(GADSDEN CO.)

02P

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